

## Solving equations using the zero product rule:

The zero product rule says that: the only way a product of 2 numbers is zero is if at least one of them is zero.

OR:  $ab=0 \Rightarrow a=0$  or  $b=0$ .

Example: Solve  $(x-3)(x+4)=0$  (Meaning find  $x$  that makes this true)

$$(x-3)(x+4)=0$$

$$\Rightarrow x-3=0 \text{ or } (x+4)=0$$

$$\Rightarrow x=3 \text{ or } x=-4. \quad \left( \begin{array}{l} (3-3)(3+4)=0 \\ (-4-3)(-4+4)=0 \end{array} \right)$$

① Try Solve  $(2x-3)(x+7)=0$

Example: Solve  $6x^3 - 29x^2 + 9x = 0$

Note  $6x^3 - 29x^2 + 9x$

$$= x(6x^2 - 29x + 9)$$

$2 \cdot 3 = AC$   
 $\oplus B = -29$

$-3^3$	$-1$	$-55$
$-3^3$	$2$	$-29$

$-27$	$-2$	$= -29$
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$-27 - 2 = -29$

$B \neq AC$   
have no  
common  
factors,

$$\begin{aligned} \text{So } 6x^2 - 29x + 9 &= (6x^2 - 27x) + (-2x + 9) \\ &= 3x(2x - 9) + (-1)(2x - 9) \\ &= (2x - 9)(3x - 1) \end{aligned}$$

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So,  $0 = 6x^3 - 29x^2 + 9x = x(2x - 9)(3x - 1)$ :

$$\Rightarrow x=0, 2x-9=0 \text{ or } 3x-1=0$$

$$\Rightarrow x=0, x=\frac{9}{2}, \text{ or } x=\frac{1}{3}.$$

② Try: Solve:  $6x^2 - 19x + 10 = 0$ .

Ans

①  $x = \frac{3}{2}$  or  $-7$ .

②  $x = \frac{2}{3}$  or  $\frac{5}{2}$